

BREATHING PATTERN

1. Physiology of breathing -

1. Breathing is a process by which O_2 is taken in and CO_2 is given out of the body.
2. It is the process of gas exchange that occurs in alveoli by passive diffusion of gases b/w the alveoli & blood.
3. The normal rate of breathing is 12-20/min (in adults) & 30-50/min (in infants).
4. The normal relaxed breathing is called as 'EUPNEA'.

* Parameters of assessing -

1. Rate.
2. Depth.
3. Rhythm.
4. Character.

- ① normal ratio of inspiration to expiration - 1:2
- ② pt. with chronic disease - 1:1 or 1:1.5
- ③ activity - 1:1

Abnormal Breathing Patterns -

1. Apnea.
2. Tachypnea.
3. Bradypnea.
4. Hyperventilation.
5. Kussmaul breathing.
6. Cheyne - Stokes breathing.
7. Biot's / atoxic breathing.
8. Sighing breathing.
9. obstructed breathing.

APNEA :- suspension of breathing.
No movement of muscle of respiration & volume of lungs remains same.

→ No airflow into or out from the lungs.
→ gaseous exchange & cellular respiration is not affected.

→ apnea can be achieved -

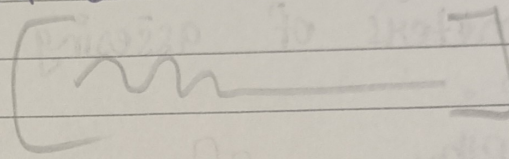
- i) voluntarily (breath holding)
- ii) Mechanically - strangulation / choking
- iii) From neurological trauma.

→ Apneic Oxygenation.

→ Apnea test in determining brain death -

• The 3 diagnostic criteria of brain death are as follow -

- i) Coma.
- ii) Absence of pulse.
- iii) Apnea.



Q) **TACHYPNEA** - Tachypnoea :-

- i) The rate of breathing i.e. > 20 breaths / min.
- ii) characterized by rapid, shallow breathing.

→ It is seen in following conditions -

1. fever.
2. Pneumonia.
3. compensatory resp. alkalosis.
4. Respiratory insufficiency.
5. lesions to resp. centers in brain.
6. Salicylate poisoning.
7. elevated diaphragm.

→ Transient tachypnea of newborns.

3. BRADYPNEA :-

- Use rate of breathing i.e. < 12 breaths/min.
- characterized by slow, shallow breathing.

4. Hyperventilation :- characterized by rapid, deep breathing.

- Caused by rise levels of CO_2 .
- other causes include,
 - i) anxiety or pain.
 - ii) excessive use of aspirin.
 - iii) obstructive disorders — COPD, asthma, & pulmonary embolism.
 - iv) Infections — pneumonia.
 - v) congestive heart failure.
 - vi) Diabetic ketoacidosis.

* ~~JMP~~ KUSSMAUL Breathing :-

1. Rapid, gasping & very deep type of labored breathing.
2. Commonly called as "air hunger".
3. It is named for —
"Adolph Kussmaul — a German doctor who 1st noted it among pt with advanced diabetes mellitus.
4. It is associated with severe metabolic acidosis, particularly diabetic ketoacidosis.

17/2) CHEYNE - STOKES BREATHING -

1. also called as "periodic breathing".
2. This condition was named after "John Cheyne & William Stokes, the physicians who 1st described it in 19th century.

→ characterized by alternate periods of tachypnea & apnea.

→ occurs as a compensation for changing serum PO_2 & PCO_2 , & classically seen in damage to pons where resp. centers are located.

* **Agonal Breathing** - shallow & very slow inspirations (about 3-4 breath/min.) followed by irregular pauses of apnea.

→ characterized by gasping, labored breathing, accompanied by strange vocalization.

→ Causes include -

- 1) cerebral ischemia
- 2) severe hypoxia / anoxia
- 3) cardiac arrest.